

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-13. (canceled)

14. (new) A method for producing a soft magnetic material, comprising:

- a surface oxidation step of forming oxide films on the surfaces of a soft magnetic powder,
- a step of preparing a molding compound of the soft magnetic powder for press-molding the soft magnetic powder,
- a press molding step of press-molding the molding compound of the soft magnetic powder into a predetermined shape, and
- a sintering step of sintering the press-molded soft magnetic powder by elevating the temperature of the periphery of the oxide film to near the melting point using a millimeter wave sintering apparatus or a discharge plasma sintering apparatus to produce a soft magnetic material, wherein a Cu base powder is added to a raw material of the soft magnetic powder and the added raw material is pulverized by a grinder in a step of preparing the soft magnetic powder.

15. (new) A method for producing a soft magnetic material according to Claim 14, which further comprises a step of heating a soft magnetic powder in a reducing atmosphere to activate the surfaces of the soft magnetic powder before the surface oxidation step.

16. (new) A method for producing a soft magnetic material according to Claim 14, wherein, in the surface oxidation step, the oxide film is formed on the surfaces of the soft magnetic powder by heating the surfaces of the soft magnetic powder in an oxidizing atmosphere using a millimeter wave sintering apparatus or a discharge plasma sintering apparatus.

17. (new) A method for producing a soft magnetic material according to Claim 14, wherein the soft magnetic powder has an average particle diameter of 0.01 to 10 micrometers.

18. (new) A method for producing a soft magnetic material according to Claim 14, wherein the soft magnetic powder contains a Fe-Al alloy, a Fe-Al-Si alloy, a Fe-Si alloy, or Fe as a principal component.

19. (new) A method for producing a soft magnetic material according to Claim 14, wherein 0.5 to 2 percent of the Cu base powder is added to the raw material of the soft magnetic powder.

20. (new) A method for producing a soft magnetic material according to Claim 14, wherein the soft magnetic powder has an average particle diameter of 0.01 to 1 micrometers.

21. (new) A method for producing a soft magnetic material, comprising:
a surface oxidation step of forming oxide films on the surfaces of a soft magnetic powder,

a step of preparing a molding compound of the soft magnetic powder for press-molding the soft magnetic powder,

a press molding and sintering step of sintering a press-molded soft magnetic powder by elevating the temperature of the periphery of the oxide film to near the melting point using a millimeter wave sintering apparatus or a discharge plasma sintering apparatus while press-molding the molding compound of the soft magnetic powder into a predetermined shape to produce a soft magnetic material, wherein a Cu base powder is added to a raw material of the soft magnetic powder and the added raw material is pulverized by a grinder in a step of preparing the soft magnetic powder.

22. (new) A method for producing a soft magnetic material according to Claim 21, which further comprises a step of heating a soft magnetic powder in a reducing atmosphere to activate the surfaces of the soft magnetic powder before the surface oxidation step.

23. (new) A method for producing a soft magnetic material according to Claim 21, wherein, in the surface oxidation step, the oxide film is formed on the surfaces of the soft magnetic powder by heating the surfaces of the soft magnetic powder in an oxidizing atmosphere using a millimeter wave sintering apparatus or a discharge plasma sintering apparatus.

24. (new) A method for producing a soft magnetic material according to Claim 21, wherein the soft magnetic powder has an average particle diameter of 0.01 to 10 micrometers.

25. (new) A method for producing a soft magnetic material according to Claim 21, wherein the soft magnetic powder contains a Fe-Al alloy, a Fe-Al-Si alloy, a Fe-Si alloy, or Fe as a principal component.

26. (new) A method for producing a soft magnetic material according to Claim 21, wherein 0.5 to 2 percent of the Cu base powder is added to the raw material of the soft magnetic powder.

27. (new) A method for producing a soft magnetic material according to Claim 21, wherein the soft magnetic powder has an average particle diameter of 0.01 to 1 micrometers.

28. (new) A method for producing a soft magnetic material comprising:

- a surface oxidation step of forming oxide films on the surfaces of a soft magnetic powder;
- a step of preparing a molding compound of the soft magnetic powder for press-molding the soft magnetic powder;
- a press molding step of press-molding the molding compound of the soft magnetic powder into a predetermined shape; and
- a sintering step of sintering the press-molded soft magnetic powder to produce a soft magnetic material, characterized by:
 - forming oxide films having a thickness of several nanometers on the surfaces of the soft magnetic powder by locally heating only the oxidized portion produced on the surfaces of the soft magnetic powder during the preparation of the powder, in an oxidizing atmosphere, to a temperature at which an oxide film is formed, and
 - using a millimeter wave sintering apparatus or a discharge plasma sintering apparatus in the surface oxidation step.

29. (new) A method for producing a soft magnetic material according to Claim 28, wherein, in the surface oxidation step, the oxide film is formed on the surfaces of the soft magnetic powder by heating the surfaces of the soft magnetic powder in an oxidizing atmosphere using a millimeter wave sintering apparatus or a discharge plasma sintering apparatus.

30. (new) A method for producing a soft magnetic material according to Claim 28, wherein the soft magnetic powder has an average particle diameter of 0.01 to 10 micrometers.

31. (new) A method for producing a soft magnetic material according to Claim 28, wherein the soft magnetic powder contains a Fe-Al alloy, a Fe-Al-Si alloy, a Fe-Si alloy, or Fe as a principal component.

32. (new) A method for producing a soft magnetic material according to Claim 28, wherein a Cu base powder is added to a raw material of the soft magnetic powder and the added raw material is pulverized by a grinder in a step of preparing the soft magnetic powder.

33. (new) A method for producing a soft magnetic material according to Claim 28, which further comprises a step of heating a soft magnetic powder in a reducing atmosphere to activate the surfaces of the soft magnetic powder before the surface oxidation step.